the afternoon I left the train at Cooran and took up my quarters in a delightful little wayside inn surrounded by ferns. On going up to the house I detected at once the genuine Lancashire dialect, and knew that the owner hailed from within ten miles of Manchester. I was accordingly made welcome, and wandered out to do a little collecting before evening came on. I found myself just on the northern border of the palm scrub which ran in a broad belt of about twenty miles width across the country from east to west, inland from the sea coast. The country was fairly hilly with a few isolated peaks standing out clearly. I was just at the base of one of these—Cooran—and to the south lay two more—Cooroora and Pimparan. South from these again the ridges increased in height, and then the country fell away into the slightly undulating plains which stretched eastwards towards Bribie Island and southwards to Brisbane. Some remarkable peaks, called the Glass Mountains, mark the southern end of the hilly district.

So far as animals are concerned, I was much disappointed with this palm scrub, but equally delighted with the richness of the vegetation.

Commencing first near to Cooran, I followed back the line and "log-rolled," finding a few worms and four land planarians (*Rhynchodemus obscurus*), a small, dark-coloured form, and *Geoplana cœrulea* and *variegata*, together with specimens of a very small new white species, to which Dr. Dendy has given the name of *G. minor*. After long searching I came across *Peripatus leuckartii*, very dark purple in colour and evidently similar to the typical form and without the curious diamond-shaped markings characteristic of the Victorian form. Though searching hard, I only found nine specimens altogether, and all these close to Cooran. Most of my time was spent in this scrub at different parts, and usually in company with George Martin, the son of my Lancashire friends, who helped me very considerably in collecting. The scrub was very thick with vines and prickly lawyers and barristers and supplejack, making progress tedious, and there were comparatively few logs on the ground. What delighted me most were the ferns. The trunks of the pines and gums were often covered over with them and with orchids. High up were enormous clumps of the bird-nest fern (*Asplenium nidus*), and larger ones of the staghorn (*Acrostichum alcicorne*). Some of the latter measured fully twelve feet through, and from them hung down lovely pendant fronds of smaller ferns, especially of *Polypodium tenellum*, which is locally known as the feather fern. On the ground grew various species of Davallia, Adiantum, Pteris, Doodia, Aspidium, Polypodium, &c. Perhaps the most beautiful of all were the large and delicate fronds of *Adiantum formosum*. There were apparently three forms of palms—species of Ptychosperma, Livistona, and Kentia. The latter is very common, and usually known as the walking-stick palm. In the scrub were great pine trees, and under the bark stripped off from these, and lying about in large slabs, I expected to find any number of worms and insects, but was much disappointed. Millipedes and scorpions were there, and two large forms of land shells; but scarcely an insect to be seen, and not a planarian or peripatus. I got a few new species of earthworms, of which, again, the commonest form was *Cryptodrilus purpureus*; and in rotten logs, which, unfortunately, were few in number, were large forms of cockroaches. The earthworms formed the best part of my collection here, and comprised representatives of five genera—Perichæta, Megascolides (one species, the only one found), Cryptodrilus, Perissogaster, and Acanthodrilus. The latter is only recorded, as yet, from Northern Australia, where there are two species, and is characteristic of New Zealand. Perissogaster is peculiarly Australian and has only three species yet known. My specimens were obtained by digging on the banks of a creek at Cooran and were whitish in colour and about 1 to 1½ feet in length. The boys use them for fishing, quite unaware of their scientific value.

In Queensland, as in Victoria, I could very rarely, indeed, find traces of casts made by worms or of leaves dragged down into the burrows, and it would appear that here, as in Africa, the ants are of more use than the worms as agents in turning over the soil. Under the bark and logs were a few frogs—*Pseudophyrne bibronii* and *coriacea*, *Crinia signifera*, and a female specimen of *Cryptotis brevis*. In certain spots there were great numbers of trap-door spiders. Some of the tubes, which led for about 2-4 inches down into the ground, were an inch in diameter. The top of the tube, with its semi-circular trap-door, projects slightly above the surface.

One of the most striking features of the scrub were the epiphytic orchids, of which, owing to its size and large pendant masses of yellow-brown flowers, *Cymbidium canaliculatum* was the most noticeable. In parts the ground was crimson with the fallen berries of a species of Eugenia: we cut one down about sixty feet high, laden with fruit, which has a tart taste, and from its colour and size has caused the tree to be known as the native cherry. Another Eugenia has a large purple fruit, and is hence known as the native plum. High up, some fifty feet above ground, we saw hanging down clusters of light brown fruit. Luckily there was a hanging vine close at hand, and up this George Martin went like a monkey. The fruit belonged to the tree *Dysoxylon rufum*, and each was covered over with innumerable minute stiff hairs, which pierced the skin in hundreds. Other plants we noticed were the wistaria, which here grows wild, *Dracœna angustifolia*, and one which Baron von Mueller has marked as rare—*Rhipogonum elseyanum*. Two dangerous ones are common, one with large bright green leaves and succulent sheathing stalks, which is locally known as the "Congey Boy"—this is eaten greedily by the native turkeys, but has the effect of making a man's tongue swell to an enormous extent; the other is the stinging tree, *Urtica gigas*—the sting of this is extremely painful, and seems to prove fatal to horses, driving them rapidly frantic.

Close by the base of Mount Cooroora, a beautiful specimen of *Macrozamia denisoni* in fruit was growing, and on Mount Cooran the rock on the western side was completely overgrown with staghorn and bird-nest ferns and with an orchid, *Dendrobium* (sp.), with beautiful clusters of delicate white flowers, amongst which trailed *Kennedya rubicunda*, its bright red blossoms contrasting strongly with the pure white of the orchids.

My last day I spent at the Glass Mountains—curious cone-like basaltic structures rising abruptly from almost flat country. The day was oppressively hot, making it no small exertion to even turn over a log, and as the sun went down a heavy storm came up, and from the train I caught my last glimpses of this delightful district lit up by almost incessant flashes of brilliant lightning.

SCIENTIFIC SERIALS.

The American Journal of Science, July.—The change of heat conductivity on passing isothermally from solid to liquid, by C. Barus. The method employed was a modification of Weber's, who placed a thin, wide, plane-parallel plate or layer of the substance to be examined between and in close contact with two thick plates of copper. The system was first heated so as to be at a given temperature throughout. It was then suddenly and permanently cooled at the lower surface, and the time-rate at which heat travelled from the top plate to the bottom plate, through the intervening layer, was measured by a thermo-couple. From these data the absolute thermal conductivity of the layer may be computed, the constants of the system being known. In the experiments discussed, the liquid was thymol, which can be kept either solid or liquid between 0° and 50° C. This was heated above its melting point, and introduced through a central hole in the upper plate; it was then allowed to cool down until undercooled. The temperature was regulated by enclosing the whole apparatus in a sheet-iron jacket, through which water was kept circulating. The lower plate could be cooled by flushing it with water from below. The difference of temperature of the plates was measured by means of a copper german-silver couple. The liquid was solidified by introducing a crystal through the central hole. The results obtained gave for the absolute conductivity of thymol in g/cs:

Solid thymol at 12°, $k = 359 \times 10^{-6}$
Liquid thymol at 13°, $k = 313 \times 10^{-6}$

The thermometric conductivity was found to be—

For solid thymol at 12°, $= 1077 \times 10^{-6}$
For liquid thymol at 13°, $= 691 \times 10^{-6}$

—On polybasite and tennantite from the Mollie Gibson mine in Aspen, Colorado: by S. L. Penfield and Stanley H. Pearce. Large quantities of polybasite or "brittle silver" have been mined nearly free from gangue, assaying from 10,000 to 16,000 ounces of silver to the ton. Tennantite, arsenical tetrahedrite, or "grey copper," was found in smaller quantities, containing about fourteen ounces of silver. The rich ore occurs between a

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hanging wall of black carbonaceous shale and a foot wall of grey magnesian limestone, which is probably of lower carboniferous age. The ore is richest and most abundant immediately under the black shales. Other minerals observed are native silver, argentite, galena, sphalerite, siderite, barite, and calcite.—Post-Laramie deposits of Colorado, by Whitman Cross. This paper, published by permission of the director of the United States Geological Survey, deals with some beds occurring between the lowest eocene and the marine cretaceous deposits, which have hitherto been classed with the Laramie formation of the Rocky Mountains. The age of the firm grey sandstones and coal-measures of the latter has long been doubtful, and they have been variously described as secondary and tertiary. In the Denver region, two beds are found overlying the Laramie unconformably, the one consisting of a pebbly conglomerate, the other of débris of andesitic lavas; they have been termed the Denver and Arapahoe formations respectively. Their equivalents have been found in various other parts of Colorado. When, after the continental elevation which caused the retreat of the Laramie seas, sedimentation began again, it was in comparatively small seas or lakes. Succeeding the first period of lake-beds came a time of great volcanic outbursts over a large area. The length of geologic time occupied may not have been very great, but the extent of country in which eruptions occurred at this time, and the great variety of lavas found in the Denver and Middle Park regions, argue for the decided importance of the event as a dynamic manifestation. The writer wishes to advocate the restriction of the term Laramie, in accordance with its original definition, to the series of conformable beds succeeding the marine Montana cretaceous, and the grouping of the post-Laramie lake beds in another series, to which a comprehensive name shall eventually be given.—On the alkali-metal pentahalides, by H. L. Wells and H. L. Wheeler. With their crystallography, by S. L. Penfield. An account of the preparation and properties of compounds of the formulæ CsI_5, $CsBr_5$, $CsCl.Cl_3I$, $RbCl.Cl_3I$, $KCl.Cl_3I$, $NaCl.Cl_3I.2H_2O$, $LiCl.Cl_3I.4H_2O$. The first is triclinic, the third, fourth, and fifth are monoclinic, and the Na salt is orthorhombic.—Fossils in the "archæan" rocks of Central Piedmont, Virginia, by N. H. Darton. Remains of crinoids belonging to the upper Ordovician fauna were found in the roofing slate of Arvon, Buckingham County, Virginia, which has hitherto been classified as Huronian.—Notes on the Cambrian rocks of Virginia and the southern Appalachians, by Chas. D. Walcott. It is shown that towards the close of middle Cambrian time, and during upper Cambrian time, there was a decided continental movement, resulting in the depression of the interior continental plateau, and that this was accompanied by the formation of conglomerates of the older Cambrian rocks in the valley of the St. Lawrence, and by a great deposition of sediments of later Cambrian time in the southern Appalachian region.—Synthesis of the minerals crocoite and phœnicochroite, by C. Ludeking, Ph.D. This was accomplished by exposing for several months to the air a solution of lead chromate in caustic potash in a flat dish. A mixture of the two kinds of crystals resulted, which could be easily sorted by means of a pincette.—A hint with respect to the origin of terraces in glaciated regions, by Ralph S. Tarr. Tracing a resemblance between the flood terraces of the Colorado in Texas, and the glacial terraces of the Connecticut.—Occurrence of a quartz boulder in the Sharon coal of north-eastern Ohio, by E. Orton.—A method of increasing the range of the capillary electrometer, by John Whitmore. An account of some experiments performed in the Sloane Physical Laboratory of Yale College, with a view towards improving the mercury and sulphuric acid electrometer as constructed by Lippmann and Pratt. Instead of having alternate bubbles of the two liquids, the surface of the mercury exposed to oxygen polarization was increased by blowing the tube into bulbs at the junction. A series of bulbs was blown, spaced at equal intervals along a capillary tube, the diameter of the bulbs being two centimetres, that of the tube 0·6 mm.; then the tube was so bent, that the whole contained as many U-shaped parts as there were cells. One arm of each U was provided with a bulb, which was situated at a distance of two-thirds the height of the U from the base. The apparatus was filled by connecting it with an aspirator, and drawing in sufficient mercury to half fill each bulb, after which dilute sulphuric acid was added by the same means. Platinum electrodes were used, and the variations in the height of the mercury columns produced by the E.M.F. examined, were read by means of a cathetometer. The deflection produced by a standard Clark cell was 3·20 mm. The range of the instrument is limited by the E.M.F. required to produce continuous electrolysis, but it was found that it could be considerably increased by using a larger number of cells in series. It is possible to determine with this electrometer the E.M.F. of a cell correctly to 0·001 of a volt.

SOCIETIES AND ACADEMIES.

LONDON.

Chemical Society, June 16.—Prof. A. Crum Brown, F.R.S., President, in the chair.—The following papers were read:—Contributions to an international system of nomenclature. The nomenclature of cycloids, by H. E. Armstrong. An account was given of the proceedings at the recent Conference on Chemical Nomenclature at Geneva, and attention was directed to the significance of the chief resolutions. A report of the conclusions arrived at by the Conference has already appeared in NATURE (this vol., p. 56).—The production of pyridine derivatives from the lactone of triacetic acid, by N. Collie and W. S. Myers. The product of the interaction of ammonia and triacetic lactone is most probably an $\alpha\gamma$-dihydroxy-α-picoline. By the action of phosphorus oxychloride on this substance a compound possessing all the properties of a dichloropicoline is obtained, and on passing this, together with hydrogen, over heated zinc-dust, α-picoline boiling at 128–129° is produced. The melting points of the platini- and auri-chlorides, obtained from the synthetical alkaloid, agree with those given by the corresponding compounds prepared from pure α-picoline which was made by heating pyridine methiodide.—The fermentation of arabinose by *Bacillus ethaceticus*, by P. F. Frankland and J. MacGregor. The products are qualitatively the same as were obtained in the fermentations of glycerol by the same organism, consisting of ethyl alcohol, acetic acid, carbon dioxide, hydrogen, and traces of succinic acid, together with another acid which was not identified. When the fermentation is conducted in a closed space a notable proportion of formic acid also occurs among the products. In this case the products are formed approximately in the proportions—$3C_2H_6O$, $3C_2H_4O_2$, $4CH_2O_2$, the formic acid as well as the carbon dioxide and hydrogen found being all collected together as formic acid in this statement. In the fermentations conducted in flasks plugged only with cotton wool, on the other hand, the alcohol and acetic acid were formed in the proportion $2C_2H_6O$, $3C_2H_4O_2$. It appears, therefore, that in the fermentation of arabinose by *Bacillus ethaceticus*, the proportion of acetic acid to alcohol is greater than in that of dextrose, and still greater than in the cases of mannitol and glycerol, but less than in that of glyceric acid.—Resolution of lactic acid into its optically active components, by T. Purdie and J. W. Walker. The authors have resolves ordinary inactive lactic acid into lævo- and dextro-lactic acid by taking advantage of the different solubilities of the strychnine salts of these components. Strychnine lævolactate is considerably less soluble in water than the dextrolactate, although both salts may be crystallised. By fractional crystallization of the mixed salts and subsequent removal of the strychnine from the crystals and mother liquor, by means of ammonia or barium hydrate, solutions were obtained which were respectively dextro- and lævo-gyrate. The dextrolactate yielded a zinc dextrolactate having the same composition and solubility as zinc sarcolactate. A well-defined dextro zinc ammonium salt of the composition $Zn.NH_4(C_3H_5O_3)_3, 2H_2O$ having the specific rotatory power $[\alpha]_D = +6{\cdot}49$ (approx.) was prepared. The dextrogyrate salts yield a lævogyrate acid, which, like sarcolactic acid, gives an oppositely active anhydride. The quantities of oppositely active acids separated from each other by means of the strychnine salts possessed equal amounts of optical activity. Fermentation lactic acid is thus shown by analysis to consist of two oppositely active isomeric acids, one of which is identical with dextrogyrate sarcolactic acid, and the other with the lævogyrate acid prepared by Schardinger by the bacterial decomposition of cane sugar.—A new method for determining the number of NH_2 groups in certain organic bases, by R. Meldola and E. M. Hawkins. In order to ascertain the number of NH_2 groups present in certain organic bases the authors propose to form the azoimides; on analysis of these substances, the number of amidogen groups which have been diazotized, can be determined. For example, paradiamidoazobenzene $(NH_2.C_6H_4)_2N_2$ was diazotized and converted into

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